

Conjugated Oligoelectrolytes as an Electron Mediator for Microbial Fuel Cells and Photocurrent Generation

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Conjugated Oligoelectrolytes (COEs) can be defined as oligomers having backbones with π -delocalized structures and pendant substituent with ionic functionalities. The properties combine the physiochemical properties that depend on variable long-range interactions with the rigid and highly hydrophobic nature of conjugated oligomers. Unlike the majority of neutral conjugated oligomers, COEs can be dissolved in highly polar solvents. This feature opens unique possibilities in emerging technologies. In this presentation, the modification of lipid membranes was carried out by incorporating phenylenevinylene oligoelectrolytes with the goal of tailoring their optical and electronic properties and their applications. The COEs facilitate transmembrane electron transport across lipid bilayers supported on glassy carbon electrodes. Thus notable increases in yeast microbial fuel cell performance were observed. Additionally, photocurrent could be generated when COEs was used as a donor in a combination with a sensitizer and an acceptor.